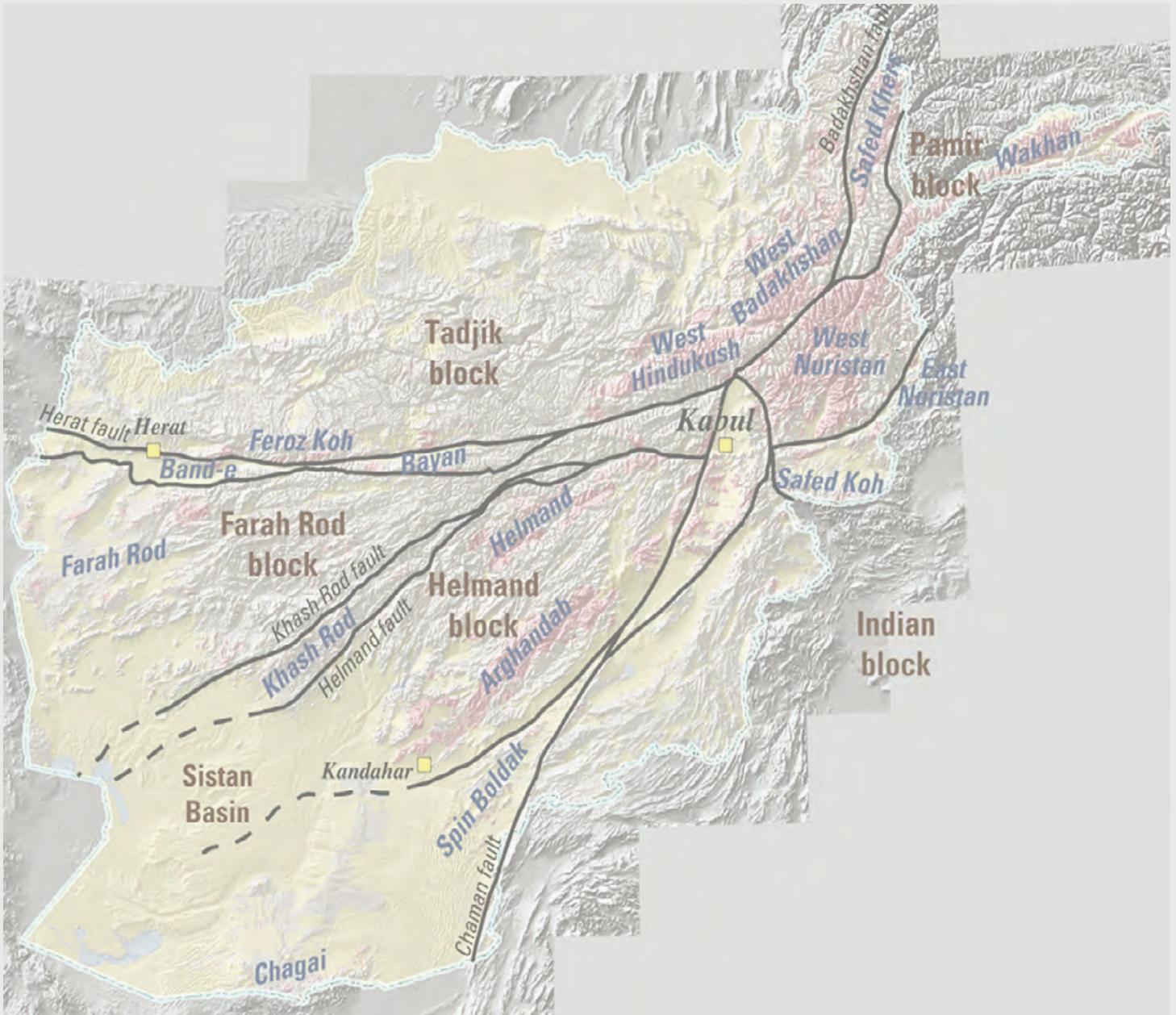


A User-Friendly, Keyword-Searchable Database of Geoscientific References Through 2007 for Afghanistan



Data Series 323

Cover. Map of Afghanistan showing major structural blocks (brown labels), plutonic belts (blue labels), and faults (black labels). Plutonic rocks are in red. Image adapted from Ludington, S., Orris, G.J., Bolm, K.S., Peters, S.G., and the U.S. Geological Survey-Afghanistan Ministry of Mines and Industry Joint Mineral Resource Assessment Team, 2007, Preliminary Mineral Resource Assessment of Selected Mineral Deposit Types in Afghanistan, U.S. Geological Survey Open-File Report 2007-1005, 44 p. Available at <http://pubs.usgs.gov/of/2007/100>

A User-Friendly, Keyword-Searchable Database of Geoscientific References Through 2007 for Afghanistan

By Robert G. Eppinger, Julianna Sipeki, and M.L. Sco Scofield

USGS Afghanistan Project Product 163

Data Series 323

**U.S. Department of the Interior
U.S. Geological Survey**

U.S. Department of the Interior
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U.S. Geological Survey
Mark D. Myers, Director

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A User-Friendly, Keyword-Searchable Database of Geoscientific References Through 2007 for Afghanistan

By Robert G. Eppinger,¹ Julianna Sipeki,¹ and M.L. Sco Scofield²

Abstract

This report includes a document and accompanying Microsoft Access 2003 database of geoscientific references for the country of Afghanistan. The reference compilation is part of a larger joint study of Afghanistan's energy, mineral, and water resources, and geologic hazards currently underway by the U.S. Geological Survey, the British Geological Survey, and the Afghanistan Geological Survey. The database includes both published ($n = 2,489$) and unpublished ($n = 176$) references compiled through calendar year 2007. The references comprise two separate tables in the Access database. The reference database includes a user-friendly, keyword-searchable interface and only minimum knowledge of the use of Microsoft Access is required.

Introduction

This report describes an accompanying database of geoscientific references for the country of Afghanistan. The reference compilation is part of a larger joint study of Afghanistan's energy, mineral, and water resources, and geologic hazards currently underway by the U.S. Geological Survey, the British Geological Survey, and the Afghanistan Geological Survey.

The compilation of geoscientific references was initially planned to contain only mineral-resource-related references. However, the effort soon grew to encompass references related to water resources, energy resources, geologic hazards, and other geoscientific disciplines. Version 1 of the reference database (Eppinger and Sipeki, 2006) contained 1,157 published and 168 unpublished references, and was available online only. Version 2 of the reference database (Eppinger and others, 2007) was compiled through September 2007, and the number of published references was more than doubled. This Data Series report contains references compiled through calendar year 2007 and contains 2,665 published and unpublished references. Unpublished references are generally internal governmental reports that were discovered during this compilation process.

The electronic database is in Microsoft Access 2003 format. An IBM PC-compatible computer is required as Microsoft Access is presently available only for PCs. The reference database includes a user-friendly, keyword-searchable interface, and only minimum knowledge of the use of Microsoft Access is required. The database was designed using a 1024 × 768 pixel display with the Microsoft Windows XP operating system. The database and document together are about 6 MB. The database on this CD-ROM, *AfghRefDatabase_DS-323.mbd*, is provided as a self-extracting WinZip .exe file, *AfghRefDatabase_DS.exe*. Double click on the .exe file and specify a location on the hard disk for unzipping the file. The default location for the unzipped file is C:\. To avoid error messages, the database file *AfghRefDatabase_DS-323.mbd* should be copied to and opened from the user's hard disk rather than burned to a CD-ROM; attempting to run queries on Microsoft Access database files stored on a CD-ROM generates errors, as Access needs space to write temporary scratch files.

This database includes both published ($n = 2,489$) and unpublished ($n = 176$) references as two separate tables in the Access database. The published references table (*tblPublishedReferences*) includes a GeoRef accession number when available (American Geological Institute, 2006, accessed 8/28/2007), which can be used for linking the reference to the GeoRef database. Some 1,212 of the 2,489 published references have GeoRef accession numbers or record IDs from the GeoRef preview database (accessed 9/5/2007 at <http://www.agiweb.org/georef/online/db/preview.html>). The published references table also includes the U.S. Geological Survey library call number, if the library contains the holding. Rights to use the references in the GeoRef database were purchased from the American Geological Institute so they could be re-distributed here without copyright infringement. The unpublished references table (*tblUnPublishedReferences*) contains citations identified as unpublished, internal reports by various national geological survey organizations, or partial citations that were discovered during this compilation. Many of the older published and unpublished references identified here are likely housed in the archive collection of the Afghanistan Geological Survey, which has been inventoried and catalogued in a combined effort by the Afghanistan and British Geological Surveys. For information on this cataloging effort, see the website <http://www.bgs.ac.uk/afghanminerals/reports.htm>.

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The published and unpublished reference tables have keyword fields that allow for searching capability within the reference database. Keywords are separated into two broad categories: scientific and geographic/cultural. The complete lists of keywords are listed alphabetically in the database in two separate keyword tables, *tblKeywordsScientific* and *tblKeywordsGeographicCultural*. The keywords lists are reproduced in this report as appendix 1 (scientific keywords) and appendix 2 (geographic/cultural keywords). The keywords used here follow the spelling and plurality conventions recommended in the GeoRef thesaurus (Goodman, 2000). Keywords were gathered from reference titles, the overall subject matter, and, for those references listed in GeoRef, from the GeoRef keyword fields.

Original references for this database were in numerous diverse file formats and style formats, and came from various sources as indicated in the following paragraph. The references were systematically organized, and the Microsoft Access database was populated accordingly. However, a small percentage of the references were not fully decipherable (for example, a list of numbers that did not allow for confident identification of volume, issue, and page number). For these references, the sequence of numbers was left as-is in the original form.



Figure 1. The reference database opening splash screen.



Figure 2. The reference database "Main Switchboard" screen.

Sources of information for this reference compilation include libraries and colleagues of the U.S. Geological Survey (USGS), the British Geological Survey (BGS), the French Bureau de Recherches Géologiques et Minières (BRGM), the Czech Geological Survey (CGS), the German Federal Institute for Geosciences and Natural Resources (BGR), the Federal Agency on Mineral Resources of the Russian Federation (VSEGEI), and the Centre for Russian and Central Asian Mineral Studies (CERCAMS). The American Geological Institute's GeoRef and GeoRef Preview databases, historical documents of the Afghanistan Department of Geological and Mineral Survey, and the Google search engine on the internet were also used. Acknowledgment is given to these various sources for the accumulated body of references within this database. Funding for the USGS was provided by USAID (United States Agency for International Development).

Keyword-Searchable Database

Upon opening the database file, *AfghanRefDatabase_DS-323.mdb*, the user first sees a splash screen that identifies project cooperators (Afghanistan Department of Geological Survey, USAID, and USGS) (see fig. 1). The splash screen displays momentarily and is followed by the main switchboard for the database (fig. 2). On the main switchboard, the user is presented with three options: "Search," "Database Information," and "Exit Application." The "Database Information" option provides disclaimer information (under "About" and "Tech Support"), the option of viewing the database tables themselves (under "Show Database Window"), and the option of returning to the main switchboard (fig. 3). Clicking on "Show Database Window" displays a warning screen because with the database window displayed, the user has the ability to modify data tables. For seasoned Microsoft Access users, this might be the preferred way to search the data.



Figure 3. The "Database Information" screen.

Clicking on the “Search” option on the main switch-board opens the search criteria dialog screen (fig. 4). The search criteria screen is divided into four parts: scientific keywords, geographic and cultural keywords, year of publication range, and user-entered freeform keywords. At the bottom of the screen is the ability to apply the chosen search criteria to the published references (default), to the unpublished references, or to both. To use the scientific and geographic/cultural dialogs, simply click on the letter of the alphabet and the keywords starting with that letter appear in a drop-down box. Clicking a keyword from the drop-down list and then clicking “Select” places the keyword into the keyword search field. Multiple keywords can be selected. The “Year of Publication” on the search screen includes the option of “No Publication Year” to capture the few references where no publication year was listed (29 total). If no year range is selected, then all publication years are searched. The user-entered freeform keywords search all fields in the tables, including the author name fields. Thus, a search for a specific author in the database would be done by typing the author name in the freeform keyword box. Multiple freeform keywords should be separated with a semicolon (;), and a search for

a question mark symbol should be done by enclosing the question mark in brackets ([?]). User-entered freeform keywords can also include the wildcard character “*.” As an example, using the wildcard “paleo*” would produce all references having “paleo” in them (Paleozoic, paleontology, paleoseismicity, and so forth).

As an example, figure 4 shows a search screen with the following selections: scientific keyword = “carbonatites,” geographic keyword = “Khanneshin,” and no year range specified (so all years are selected). The search criteria include both the published and unpublished tables. With these selections chosen, clicking on the “Search” button results in nine references matching the above search criteria; eight of the references are published and one is not published (fig. 5). The search criteria keywords (in the example, carbonatites and Khanneshin) are listed at the top of the “Search Results” screen. On the “Search Results” screen, published references are shown first followed by unpublished references, both in alphabetical order by author. Clicking on the “New Search” button brings the user back to the search screen with the previous search criteria remaining. These criteria may be modified for a new search. A completely new search can be performed

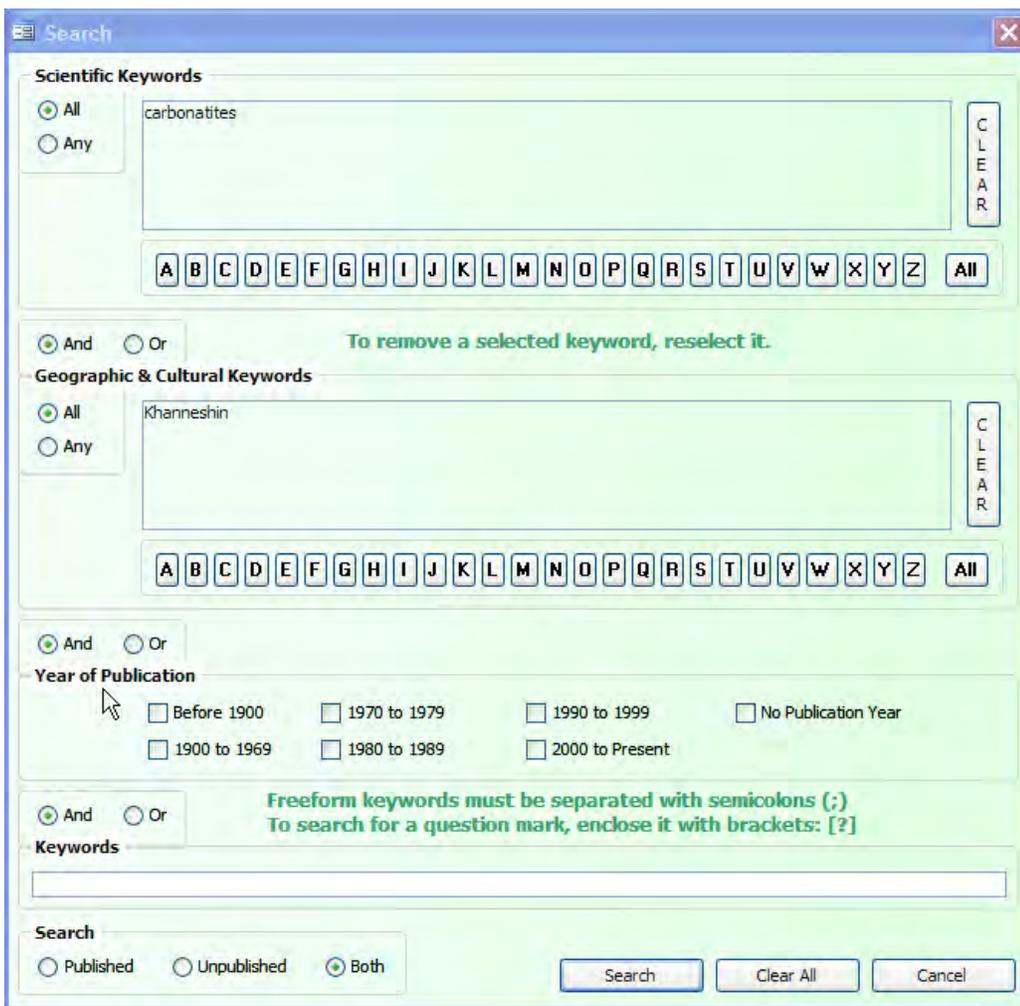


Figure 4. The search criteria dialog screen.

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by clicking the <Clear All> button; the new search criteria can be entered at this point. Those familiar with Microsoft Access may use the sorting and filtering capabilities to further refine the results list.

The “Search Results” screen includes all fields in the *tblPublishedReferences* and *tblUnpublishedReferences* tables. Also appearing at the far left of the “Search Results” screen are two additional fields generated by the searching query, “Selected” and “Published.” The “Selected” field is used for selecting specific references for output (discussed below) and the “Published” field is a Yes/No field that specifies whether the record is published or unpublished.

Database Output

Once the user is satisfied with the search results, desired references for output are chosen by using the “Selected” field on the “Search Results” screen (fig. 5). Clicking on the “Output to Word–USGS Format” button saves the selected results in a Microsoft Word document, following standard USGS style for listing references. The Microsoft Word document retains the search keywords at the top of the document and the words “Published” or “Unpublished” precedes each reference. Clicking on the

“Output to Text” button saves the selected results as ASCII comma+tab delimited text file with a .TXT extension, with the words “Published” or “Unpublished” preceding each reference. Clicking on the “Output to Excel–All Fields” button saves all of the information related to the selected reference records in a Microsoft Excel format spreadsheet. The order of references for output to Word, text, or spreadsheet format is the same as that shown on the “Search Results” screen (published, then unpublished references—both arranged alphabetically by author).

Database Structure

The published (*tblPublishedReferences*) and unpublished (*tblUnpublishedReferences*) reference tables have identical database structures. The database fields and their descriptions are listed in table 1. Microsoft Access table and query naming conventions follow those suggested by Reddick (1995, accessed 8/28/2007). The two keyword tables are simply listings of keywords used in the reference tables. They each have two fields: a text keyword field and a date field specifying when the keyword was entered in the database.

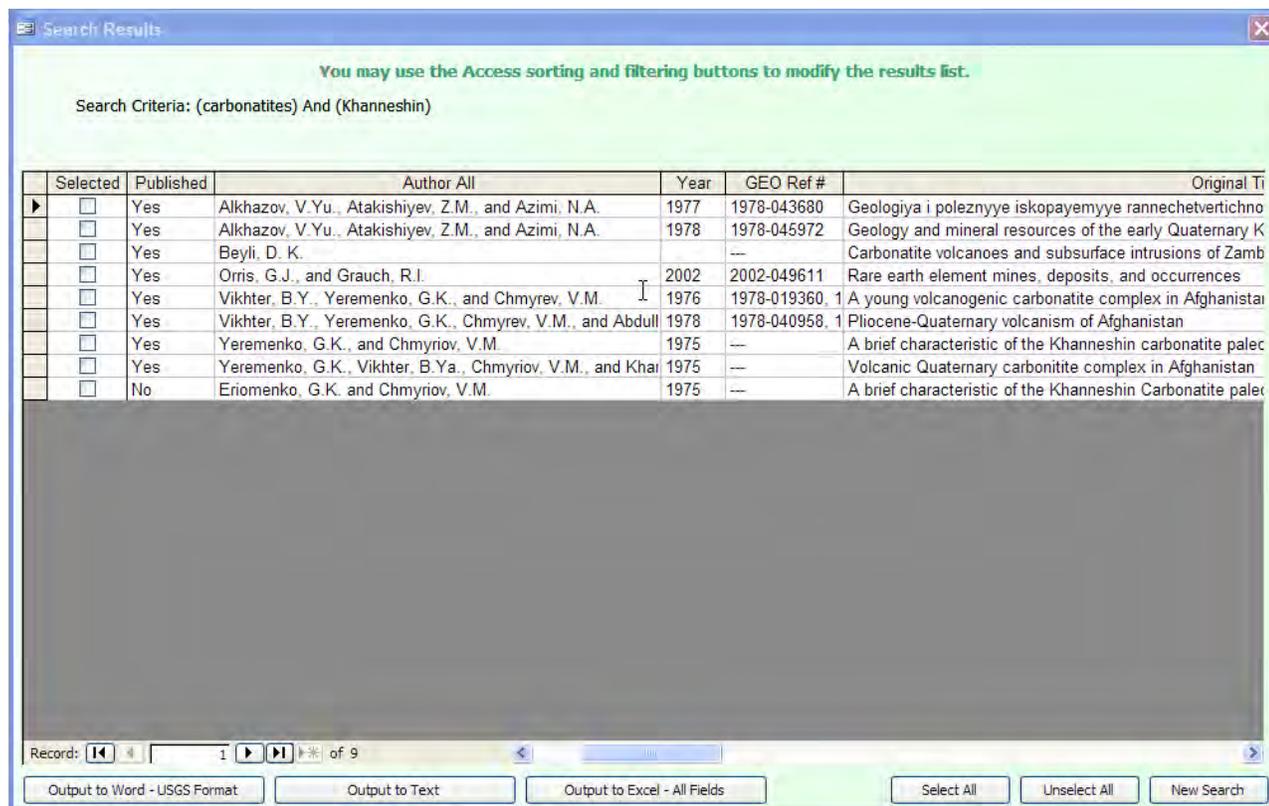


Figure 5. Example “Search Results” screen.

Table 1. Database field names and descriptions for reference tables.

Field name	Field type	Description of field
Index	AutoNumber	Key field and database index
AuthorSenior	text	First author, in the format: Last name, first name (initials or spelled out)
AuthorSecondary	text	Additional authors, same format as above, listed sequentially as found in reference
AuthorAll	memo	Complete author listing for building citation
PublicationYear	text	Year of publication
GEORefAccessionID	text	ID that ties reference to the AGI GeoRef database; blank if no data
USGSLibraryID	text	ID that ties reference to the U.S. Geological Survey Library system catalogue number; blank if no data
OriginalTitle	memo	Full title of reference as originally found in its native language
TranslatedTitle	text	English title translation for the reference; irregularly populated field
Source	memo	Source of the reference; for example, journal title, volume, series, and page number
DocumentType	text	Type of document for the reference
SourceForDatabase	memo	Mechanism in which the reference was found for this database
Language	text	Language of original reference
EnglishSummary	text	For non-English references, note whether there is an English translation in the paper; irregularly populated
ScientificKeywords	memo	Scientific keywords; see <i>tblKeywordsScientific</i> for complete list of keyword possibilities
GeographicCulturalKeywords	memo	Geographic and cultural keywords; see <i>tblKeywordsGeographicCultural</i> for complete list of keyword possibilities
OtherID	text	Secondary ID for the reference, such as the reference code for a different library; irregularly populated field
AuthorSeniorAltSpelling	text	First author, spelling as found in original source, if different from Author_Senior
AuthorSecondaryAltSpelling	text	Additional authors, spelling as found in original source, if different from Author_Secondary
Comment	text	Comment related to reference; irregularly populated field
DateAddedToDatabase	Date/Time	Date in which reference was added to this Access database

References Cited

American Geological Institute, 2006, The GeoRef database: Alexandria, Va., American Geological Institute [<http://www.agiweb.org/georeff/index.html>].

Eppinger, R.G., and Sipeki, Julianna, 2006, Database of geoscientific references through 2006 for Afghanistan, version 1: U.S. Geological Survey Open-File Report 2006-1370, 9 p. Available for download at <http://pubs.usgs.gov/of/2006/1370/>.

Eppinger, R.G., Sipeki, Julianna, and Scofield, M.L. Sco , 2007, Database of geoscientific references through 2007 for Afghanistan, version 2: U.S. Geological Survey Open-File Report 2007-1297, 11 p. Available for download at <http://pubs.usgs.gov/of/2007/1297/>.

Goodman, B.A., 2000, GeoRef thesaurus, 9th ed.: Alexandria, Va., American Geological Institute, 830 p.

Reddick, Greg, 1995, The Reddick VBA [Visual Basic for Applications] naming conventions: Greg Reddick. Available for download at <http://www.xoc.net/standards/rvbanc.asp>.

Appendixes

Appendix 1.—Alphabetical listing of 933 scientific keywords used in the reference database.

absolute age	archaeology	building stone	cobalt
accretion	Archean	C-13/C-12	Coelenterata
acids	areal geology	C-14	color
actinides	argillite	calc-alkalic	columbite
active faults	arid environments	calcareous	complexes
Adriatic plate	arsenic	calcite	composition
aeromagnetic surveys	arsenides	calcium	compression
Afghan block	artesian waters	Cambrian	concavisorites
Afghan plate	Arthropoda	carbon	conglomerate
afghanicus	Articulata	carbon dioxide	Coniferales
afghanite	Artiodactyla	carbonate platforms	Conodonta
African plate	asbestos	carbonate rocks	contact metamorphism
age	ASTER	carbonates	continental crust
aggregate	atlas	carbonatites	continental drift
agriculture	barite	Carboniferous	continental margin
airborne methods	barium	cartography	continental shelf
algae	basalts	Catenipora	copper
alkali basalts	basement	caves	correlation
alkali feldspar	basins	celestine	corundum
alkali metals	batholiths	cement	Cretaceous
alkalic composition	bauxite	Cenomanian	Crinoidea
alkaline earth metals	Bazardarin Formation	Cenozoic	Crinozoa
allochthons	Bennettiales	Cephalopoda	crust
alluvium	beryl	ceramic materials	Crustacea
Alpine	beryllium	Cerebropollenites	crustal shortening
Alpine orogeny	bibliography	cerium	crystal chemistry
alteration	bicarbonate	cesium	crystal growth
aluminosilicates	biofacies	chain silicates	crystal structure
aluminum	biogenic structures	Chaman fault	crystal zoning
Ammonites	biogeography	chemical composition	crystalline rocks
Ammonoidea	bioherms	chemically precipitated rocks	crystallography
amphibole group	biometry	chlorides	crystals
amphibolites	biostratigraphy	Chlorophyceae	cultural
analcime	biotite	Chlorophyta	cycles
anatase	biozones	Chordata	cyclicality
anatexis	bismuth	chromite	dacites
anatomy	Bivalvia	chromium	dams
andesites	blueschist	chrysotile	Darwaza-Sarikol sequence
Anthozoa	body waves	Cimmerian	Dasycladaceae
Anthropoda	borates	Cimmerian orogeny	dates
anticlines	boreholes	classification	debris
anticlinoria	boron	clastic rocks	décollement
antimony	Bouguer anomalies	clastic sediments	deep-seated structures
apatite	Bovidae	clay	deformation
aplite	Brachiopoda	cleavelandite	deltaic environment
aquamarine	breccia	climate	density
aquifers	bromine	climate change	deposition
Ar/Ar	brookite	clinoamphibole	depositional environment
Arabian plate	Bryophyta	clinopyroxene	depressions
aragonite	Bryozoa	coal	deuterium

development	Farah trough	geophysics	Indian plate
Devonian	fault zones	geosynclines	indicators
diabase	faults	geothermal energy	Indol-Kuban' trough
diagenesis	faunal studies	Givetian	Indonesian orogeny
diamonds	feldspar group	glacial geology	Indus melange
digital data	ferrous	glaucophane	industrial minerals
digital elevation	floodplains	global	Indus-Yarlung Zangbo suture
dikes	floods	gneisses	zone
diorites	fluid inclusions	gold	infrared spectra
discovery	fluorides	Gondwana	intrusions
displacements	fluorine	goniatites	Invertebrata
dolomite	fluorite	grabens	Iran trough
dolostone	fluorspar	grade	iron
drainage	fluvial features	granites	irrigation
drainage basins	fluvial sedimentation	granodiorites	island arcs
drilling	flysch	granulometry	isostasy
ductility	fold and thrust belts	graphite	isotopes
dunes	fold belts	Graptolithina	ixiolite
Dunghan Formation	folds	gravity anomalies	jade
dunites	foliation	gravity field	Jurassic
duplexes	Foraminifera	gravity methods	K/Ar
earthquakes	foreland basins	greenschist	Kabul block
Echinodermata	fossils	greisen	Kalatash Formation
eclogite facies	fractional crystallization	ground water	Kalu Formation
ecology	framework silicates	Gymnospermae	Kanisamys
economic geology	Frasnian	gypsum	kaolin
economics	free-air anomalies	haiweeite	Karkar Formation
Eifelian	fresh water	halides	karst
elastic waves	Fusulinidae	Haqf Group	Khargani Formation
elbaite	Fusulinina	harzburgite	Khufai Formation
electrical methods	gabbros	Hauterivian	Kotla complex
electron probe	Gaj Formation	hematite	Kubergandian
emerald	galena	Hercynian orogeny	kunzite
emplacement	Gandaf Formation	hiddenite	kyanite
endogene processes	garnet	high-grade metamorphism	Kyzyltumshuk anticline
energy resources	Gastropoda	Himalayan orogeny	Lachlan fold belt
engineering geology	Gaurdak Formation	Hippomorpha	lacustrine environment
enrichment	geanticlines	historical geology	lacustrine features
environment	gedrite	history	Ladinian
environmental geology	gems	Holocene	lakes
Eocene	genesis	hornfels	lamprophyres
eolian features	geobotany	horsts	landform evolution
epicenters	geochemical cycle	host rocks	landforms
epigene processes	geochemistry	hot springs	Landsat
erosion	geochronology	human activity	landslides
eruptions	geodynamics	hydrocarbons	lapis lazuli
Eurasian plate	geographic information	hydrochemistry	laser methods
Eutheria	systems	hydrogen	Late Triassic
evaporites	geography	hydrogen sulfide	lateral faults
evolution	geologic hazards	hydrogeology	Laurasia
exogene processes	geologic maps	hydrology	Laurentia
exploration	geologic thermometry	hydrothermal alteration	Laurussia
extension	geology	hydrothermal conditions	lava
facies	geomorphology	igneous rocks	lazurite
false color image	geophysical methods	ignimbrite	leaching
Famennian	geophysical surveys	inclusions	lead

lepidolite	microplates	nesosilicates	Paleogene
limestone	migmatites	nickel	paleogeography
lineaments	military geology	Nilssoniales	paleolatitude
lithium	mineral assemblages	niobates	paleomagmatism
lithofacies	mineral composition	niobium	paleomagnetism
lithogeochemistry	mineral data	niobotantalates	paleontology
lithosphere	mineral deposits	nitrogen	paleophydrology
lithostratigraphy	mineral economics	noble gases	paleoplacers
Lituolacea	mineral inclusions	Nogay suite	Paleoproterozoic
loess	mineral inventory	nomenclature	paleoseismicity
luminescence	mineral localities	non-ferrous	paleosols
Maestrichtian	mineral resources	nonmetals	Paleozoic
mafic composition	mineral waters	Norian	Palissya
magmas	mineralogy	normal faults	palynomorphs
magmatism	minerals	North Afghan platform	Pangaea
magnesium	mining	North American plate	Panjshir synclinorium
magnesium	minor elements	nuclear explosions	paragenesis
magnetic	Mintek Formation	Nummulites	paragneiss
magnetic anomalies	Miocene	O-18/O-16	passive margins
magnetic field	miogeosynclines	obduction	Pb/Pb
magnetic methods	miospores	oblique-slip faults	peat
magnetism	mitigation	ocean circulation	pedogenesis
magnitude	mixed-layer minerals	oceanic crust	pegmatite
major elements	mobile belts	Oligocene	pentlandite
Mammalia	Moesian platform	olistostromes	peraluminous
Mandibulata	Mohorovic discontinuity	oncolites	peridotites
manganese	molasse	ontogeny	Perissodactyla
Mansehra granite	Mollusca	onyx	permeability
mantle	molybdates	opal	Permian
maps	molybdenum	ophiolites	petalite
marbles	monazite	optical properties	Petaspermum
marine environments	monitoring	Orbitolinidae	petrography
Masirah graben	monsoons	Ordovician	petroleum
mass movements	morganite	ore-forming fluids	petroleum exploration
massifs	morphology	organic compounds	petrology
Mediterranean fold belt	Moscovian	organo-metallics	pezzottaite
melange	mountains	orogeny	Phacopida
mercury	movement	orthoclase	Phanerozoic
Mesozoic	Murgabian	orthogneiss	phosphates
metagabbro	muscovite	orthopyroxene	photogeology
metaigneous rocks	mylonites	orthosilicates	phyllites
metal ores	nannofossils	Ostracoda	phylogeny
metalimestone	nappes	overprinting	pinnules
metallogey	native elements	overthrust faults	PKP-waves
metals	natrolite	overturned folds	placers
metamorphic rocks	natural gas	Ovummuridae	planar bedding structures
metamorphism	natural resources	oxidation	Plantae
metapelite	Nawagai melange	oxides	plasticity
metasandstone	Nd-144/Nd-143	oxygen	plate boundaries
metasedimentary rocks	near-infrared spectra	ozone	plate collisions
metasomatic rocks	Neocimmerian	Pachypora	plate convergence
metasomatism	Neocomian	paleobotany	plate tectonics
metavolcanic rocks	Neogene	Paleocene	plateaus
mica group	Neoproterozoic	paleoclimate	plates
microcontinents	neotectonics	paleoecology	platforms
microfossils	nephrite	paleoenvironments	Pleistocene

Pliocene	regional metamorphism	seismic risk	stream sediment
plutons	regression	seismic waves	strike-slip faults
pneumatolysis	relative age	seismicity	stromatolites
polar wandering	remagnetization	seismograms	Stromatoporoidea
pole positions	remediation	seismology	strontium
pollen	remote sensing	seismotectonics	structural analysis
pollucite	reserves	selenite	structural controls
pollution	reservoir rocks	Senonian	structural geology
Polygnathus	resistivity	Septatournayella segmentata	structural traps
polymetamorphism	resources	serpentine group	structures
Porifera	reverse faults	serpentinites	subduction
porosity	Rhaetian	Serpukhovian	subsidence
porphyryns	Rhodophyta	shales	sulfates
porphyry	Rhynchonellida	shear	sulfides
Portlandian	rhyolites	sheet silicates	sulfur
potash	rift zones	Siahsangak synclinorium	surface water
potential deposits	ring silicates	Siberian fold belt	suture zones
Precambrian	Ripidiorhynchus	Siberian platform	S-waves
precious metals	risk assessment	silica minerals	syenites
precipitation	rivers	silicates	synclines
prediction	Rodentia	silt	synclinoria
pressure	rubidium	Silurian	syntaxis
Primates	rubies	silver	Tabulata
production	Rugosa	skarn	talc
Prospira	Ruminantia	slates	tantalates
Proterozoic	Russian plate	slip rates	tantalum
Protista	Russian platform	slope stability	tanzanite
protoliths	S-34/S-32	Sm/Nd	Tarim platform
provenance	salinity	sodalite group	taxonomy
Pseudogastrioceras roadense	salt	sodium	technology
Pseudostaffella	salt tectonics	soft sediment deformation	tectonic maps
P-T conditions	sand	soil surveys	tectonics
Pteridophyta	sandstone	soils	tectonophysics
Pteridospermae	sapphire	solution features	tectonostratigraphic units
Pteropsida	sapphirine	sorosilicates	teeth
P-waves	satellite methods	source rocks	TEM data
pyrite	schistosity	South Asian pegmatite belt	temperature
pyrochlore	schists	spatial distribution	temporal distribution
pyroclastic rocks	schorl	spectra	Tentaculites
pyroxene group	Schwagerina	spectroscopy	Tentaculitida
pyroxenite	sclerites	Spermatophyta	Tentaculitidae
quartz	Scythian	spinel	tephra
Quaternary	Scythian platform	Spiriferella	Terek-Kaspiyisk trough
radioactive isotopes	sea-floor spreading	Spiriferida	terraces
Radiolaria	sea-level changes	Spirophyton	terranes
radon	sediment hosted	spodumene	terrestrial
rare earth elements	sedimentary basins	spores	Tertiary
rare metals	sedimentary cover	springs	Tethys
Rb/Sr	sedimentary geology	Sr-87/Sr-86	Tetrabanchiata
reclamation	sedimentary petrology	stable isotopes	Tetrapoda
reconstruction	sedimentary processes	statistical analysis	Th/U
recovery	sedimentary rocks	stibiocolumbite	thallophytes
red beds	sedimentary structures	stibiotantalite	thematic mapper
reefs	sedimentation	stratiform	Theria
regional	sediments	stratigraphic traps	thermal waters
regional geology	seismic methods	stratigraphy	thermoluminescence

12 A User-Friendly, Keyword-Searchable Database of Geoscientific References Through 2007 for Afghanistan

thorium
thrust faults
tin
titanium
tomography
tonalites
topaz
topography
tourmaline
Tournayella discoidea
trace elements
trachytes
transgression
transpression
traps
travertine
Triassic
Trilobita
Trilobitomorpha
troughs
tuff
tungstates
tungsten
Turan plate
Turanian platform
Turolian
Turonian
U/Pb
Ufimian
ultrabasite
ultramafics
unconformities
Ungulata
uplifts
Ural-Oman lineament
uraninite
uranium
ursilite
Valanginian
vanadium
vegetation
veins
Vendian
Vertebrata
Visean
volcanic rocks
volcanism
volcanoes
volcanology
water management
water resources
weather
weathering
weeksite
wehrlite
Wenlockian
xenoliths
Zarak synclinorium
zeolite group
zinc
zircon
Zoantharia
Zoning

Appendix 2.—Alphabetical listing of 632 geographic/cultural keywords used in the reference database.

Ab-E-Istada	Balkh	Chapa-Dara	Doodkash
Achin	Baluch Chain	Char Shangho	Dorah Shah Dad
Afghan Central Mountains	Baluchistan	Charbagh	Dou Ab
Afghanistan	Bamian	Charburjak	Dunghan
Afghan-Tajik basin	Banat	Charikar	Dusso
Africa	Band-e-Amir	Chekhcha	Dzhar-Kuduk
Ahonkashan	Band-e-Amir Lake	Chesht-Sharif	eastern Afghanistan
Akhankashan	Bandi	Chigha Sarai	Egypt
Alai Range	Band-i-Turkestan	Chilkonshar	Elburz
Alborz	Bangladesh	China	Ertfah
Algeria	Baraki Barak	Chitral	Eurasia
Ali Khel	Barrandian	Chumar	Europe
Alishah	Bartang	Chu-Sarysu	Faizabad
Almurad	Bas	Commonwealth of Independent States	Far East
Altai Mountains	Bashkirian	Dagestan Plain	Farah
Altimur Mountains	Bayan	Darah-i-Shor-i-Karamandi	Farah Rud
Amu Darya	Bayman	Darai-Nur	Farakhrud River
Amu Darya basin	Bazar Valley	Darai-Qunar	Farakhrudskiy
Amur	Bazardarin	Darai-Sur	Farinjal
Anar	Behsud	Darband	Farkhar River
Anardara	Besham	Darkot	Faryab
Andarab	Beshud	Darrahe-Nur	Faydzabad
Andhui	Bhutan	Darra-i-Alansang	Fergana basin
Andkhoy	Bibi Gauhar	Darra-i-Pech	Gaj
Angot	Black Sea	Darre Pech	Galacheh
Anguri River	Bolan Pass	Darri-i-Suf	Gandaf
Arabian Peninsula	Bouddhas	Darr-i-Suf	Gardez
Arabian Sea	Boya	Dar-ul-Aman	Gaurdak
Aral	Bukhara	Darvaz	Gawdezereh
Aravalli Range	Bukhara-Khiva	Darvaz Range	Gaz-Khan
Arghandab	Bulan	Das Bar Valley	Gelmend
Arghandab River	Bulola	Dasht-e-Chahe-Mazar	Gelmend River
Ashkhabad	Buni Zom	Dasht-i-Nawar	Gerirud River
Asia	Butkjak Beds	Dawangh	Gharam Chasma
Asmar-Kamdesh	Buzmal	Dawlat Khan	Gharan
Asparan	Campbellpore basin	Deh Shir	Ghazgay
Assam	Carpathians	Deh-Ghulaman	Ghazni
Atlas Mountains	Caspian basin	Dehrawat	Ghizao
Attock-Cherat Range	Caspian Sea	Deli	Ghor
Awzangani	Caucasus	Djebbel-us-Saraj	Ghorband
Aynak	central Afghanistan	Djebel-al-Seraj	Ghulghola
Azrao	Chagai District	Doab	Ghuryan
Badakhshan	Chaghasaray	Dobanday	Gilgit
Badghis	Chahar-Asyab	Dobruja basin	Girishk
Badragha	Chahriaq	Dokani	Gizab
Baghlan	Chak Wardak-Syahgerd	Dolpo	Gogerdak
Bagram	Chakhansur	Donets basin	Gol-Bahar
Bagrami	Chalan-da-Lan Ridge	Donmez	Gologha
Bakhud	Chaman	Donqiao	Gowk
Bala-Murghab	Chaman-Argendeh		Gozar-e-Sah

Greater India	Jordan	Khyber Pass	Malek-Sayh-Koh
Greisbachian	Jorq-aduq	Kirman	Malestan
Gujar Killi	Jowzjan	Kirthar	Mamakhel
Gulf of Aden	Jurm	Kirthar-Soleiman Range	Mansehra
Gurziwan	Kabul	Klukisporites	Maruf-Nawa
Guyarkil	Kabul basin	Kohat	Masirah
Haibak	Kadjao	Koh-e Baba	Matun
Haji Alam	Kajakai	Koh-e Khanessin	Matuyama Chon
Hajigak	Kalat	Kohe Safi	Mawi
Haqf	Kalat-i-Ghilzai	Kohe-Mahmudo-Esmailjan	Maydan
Haramosh	Kalu	Koh-e-Sultan Saheb	Maymayk
Hari Rud	Kamar	Koh-i-Baba	Mazar-i-Sharif
Harkrez-Nish	Kandahar	Koh-i-Baba Range	Mechetli
Hazara Toghai	Kang	Kohistan	Mediterranean
Hazarajat	Karabil	Kol-i-Chaqmaqin	Middle East
Helmand	Karaj	Kol-i-Namaksar	Mingora
Herat	Karakoram	Kopet-Dag Range	Miranshah
Hercynides	Karakul	Korgal	Misan
Himachal Pradesh	Karakum	Kotagae	Molayan
Himalayas	Karakum basin	Kotagal	Moqur
Hindu Kush	Karkar	Kotalak	Moqur-Ghazni
Hindustan	Karkar-Dudkas	Kotal-i-Poz	Morocco
Hissar Range	Kashmir	Kotla	Mount Damavand
Hokumat-e-Pur-Chaman	Kasi	Kotol-e-Tera	Mount Everest
Huftkula River	Kataghan	Krasnovodsk Peninsula	Mukur
Imam-Saheb	Katakhar	Kubadag	Murghab basin
India	Katawaz	Kuen-Ian	Muzkol
Indian Ocean	Katawaz basin	Kulam	Naghlu
Indian Peninsula	Katawaz Sea	Kumar	Nahrin
Indochina	Kavir	Kunar	Nakhshir Par
Indol-Kuban'	Kawir-i-Naizar	Kundalan	Nalbandan
Indus	Kazakhstan	Kunduz	Namakab
Indus River	Kejran	Kunlun Mountains	Nanga Parbat
Indus-Yarlung Zangbo	Kelift	Kurgovat	Nangarhar
Iran	Kerman basin	Kurkhu	Nawagai
Iraq	Khaisar	Kurram	Nawar
Ishkamysh	Khaltaro	Kyzyltumshuk	Nawer
Ishpushta	Kham-Ab	Ladakh	Nawzad-e-Musa-Qala
Islam Qala	Khanaka	Laghman	Near East
Ispushta	Khandud	Lake Sarez	Nepal
Jafar Kandao	Khanneshin	Lake Shiwa	Nilau-Kulam
Jagdalek	Khargani	Laki-Bander	Nilaw
Jahangir-Naweran	Kharkrez	Lal-Sarjangan	North Africa
Jaji-Maydan	Kharzar River	Lashkargah	North Ustyurt basin
Jakal	Khawja-Jir	Lataband	northeastern Afghanistan
Jalajin	Khayr-Kot	Libya	northern Afghanistan
Jalalabad	Khinguil	Logar	northwestern Afghanistan
Jaldak	Khorassan	Loy-Khvar	Nuristan
Jamanak	Khosh	Lut	Obeh
Jamarj-i-Bala	Khost	Lut Desert	Ob-i-istada
Jamm Punjab	Khufai	Mad-Agha	Obi-Kiik
Jammu	Khurd Kabul basin	Madar	Okhankoshan
Jarm-Keshem	Khwaja	Mahabrahath Range	Oman
Jawhar	Khwaja Ghar	Maimana	Oruzgan
Jawkhar	Khwaja Gogerdak	Makhad	Pabrok
Joand	Khwaja Rawash	Makran	Pachakhak-e-Sali

Pachkamar	Samandkhan-Karez	Sri Lanka	Usoi Dam
Paghman	Samthi	Suf-Kajiran	USSR
Pakawalpelt	Sanandaj-Sirjan	Sulaiman Range	Ustyurt
Pakistan	Sang-Charak	Sultanuizdag	Uzbekistan
Paktia	Sang-e-Caspan	Sumsas	Vakhsh River
Palang	Sang-e-Masha	Surhandaria	Vekadur
Pal-e-Charki	Sang-i-Lan	Surkh Bum	Wakak
Pamirs	Sanglich	Surkhab	Wakhan
Panj Valley	Sang-Ling River	Swat	Waras
Panjao	Sare-Pori	Swat Valley	Wardak
Panjaw	Sar-e-Sang	Tachkourgan	Warsak
Panjshir	Sarhad	Tagab-e-Munjan	Waziristan
Panjshir Valley	Sar-i-Pol	Taghar	Wersek
Parapamisus	Sarlog	Taiwara	western Afghanistan
Pargan-Waigal River Valley	Sar-o-Tar	Tajik	Wurm
Parkhaw	Saudi Arabia	Tajikistan	Yahya-Wona
Parvan	Saukai Zone	Tajik-Karakum	Yakawlang
Parwan	Saydkaram	Takhar	Yaqubi
Pasa-Band	Sayghan-o-Kamard	Takht-i-Suleiman	Yarigul
Pashgushta	Seistan	Talemazar	Yatim Tagh
Patkai	Sekari	Taloqan	Yazd-Anarak
Penjao	Shabashek	Tamil Nadu	Yazgulem
Persia	Shagram	Tanawal	Zaalay Ridge
Peshawar	Shah-Esmail	Tangi-Murch	Zabul
Pir Panjal Range	Shahrak	Tannurjeh	Zagros
Polekhomri	Shaida	Taqcha Khana	Zamin Dawar
Potwar Plateau	Shamakhat River	Tarang	Zang Ridge
Pul-i-Khurmi	Sheberghan	Tarbela Dam	Zangerud
Punjab	Sher Khan River	Tarbela Lake	Zarak
Pyandzh	Sherdarvaza	Tarim	Zardalou
Pyandzh (Panj) River	Sheva River	Tarnak	Zarghunshahr
Pyandzhinskiy	Shibar	Tashkent	Zarkasan
Qala-i-Fath	Shibarghan	Tazareh	Zebak
Qal'arah	Shin-Dand	Tchakh	Zhawar Kili
Qarqin	Shodal	Tchar	Zhob
Qasim Khel	Shungus	Tezak	Zindajan
Rajhastan	Shurisai Beds	Tibet	Zin-Taza
Ramak	Siah Bubak	Tien Shan	Zirab
Rash Volcano	Siahgerd	Tirah	Zobak
Ras-Koh	Siahsangak	Tirin	Zohak
Reg-Alaqadari	Sibi	Tirin-Penjao	Zoundi-Khel
Registan Desert	Sir Band	Tizin	
Reko Diq	Sirjan-Hamadan	Trans-Indus Ranges	
Robot-e-Pai	Sistan	Tsangpo	
Rudikarokh	Siwalik	Tulak	
Rukh	Siwalik Range	Turan	
Russian Federation	Skardu	Turkestan	
Rustaq	South Kazakh	Turkey	
Sadmarda	south-central Afghanistan	Turkman	
Safed Koh	southeastern Afghanistan	Turkmenistan	
Sahara	southern Afghanistan	Urals	
Saighan	southwestern Afghanistan	Urgon	
Saindak	Spin Jumat	Urgun	
Sakhi	Spira	Urgunt Valley	
Salang	Spiti	Urusgan	
Salt Range	Sreh-Chena	Ushu	